

ORIGINAL

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of: )  
James Adair et al. )  
Serial No. 09/954,443 ) Examiner: Thanh K. Truong  
Filing Date: September 17, 2001 ) Art Unit: 3721  
For: Heat Seal Die And System And )  
Method For Portion Control Sized Packaging )

**RESPONSE TO NOTIFICATION OF NON-COMPLIANT APPEAL BRIEF**

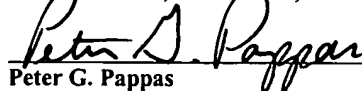
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Sir:

Responsive to the Notification of Non-Compliant Appeal Brief mailed October 11, 2005,  
Applicant submits a revised Appeal Brief in triplicate.

According to the Notification, the Office objects to the Appeal Brief because it did not contain the items required under 37 C.F.R. 41.37(c), or the items are not under the proper heading or in the proper order. In the revised Appeal Brief, Applicant has amended the "Summary of Invention" heading to "Summary of Claimed Subject Matter", added the "Grounds for Rejection to be Reviewed on Appeal" section, amended the "Claims on Appeal" heading to "Appendix 1 – Claims on Appeal", and added the "Appendix 2 – Evidence" section.

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Mail Stop Appeal Briefs – Patents, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450

  
Peter G. Pappas

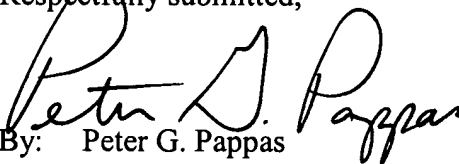
Date: November 10, 2005

Additionally, the Office objects to the Appeal Brief because it did not contain a concise statement of each ground of rejection and did not present an argument under a separate heading for each ground of rejection. Thus, in the revised Appeal Brief, a separate heading for each ground for rejection was added, as well as separate headings in the argument section for each ground of rejection.

In addition, the Office objects to the Appeal Brief because it did not contain a concise explanation of the subject matter defined in each of the independent claims involved in the appeal. In the revised Appeal Brief, Applicant has amended the summary of the claimed subject matter to include a section explaining independent claim 9 and a section explaining independent claim 18.

Applicant respectfully submits that the revised Appeal Brief is in full compliance with all formal requirements and that this response is a full and complete response to the Notification of Non-Compliant Appeal Brief. If there are any issues which can be resolved by a telephone conference, the Office is invited to contact the undersigned attorney at (404) 853-8064.

Respectfully submitted,

  
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Attorney Docket No.: 17244-0129



Art Unit: 3721

AO 1398477.1

## II. Related Appeals and Interferences

There are no appeals or interferences related to the appeal of the present application.

## III. Status of Claims

Claims 9, 12-18, and 21-26 are pending for purposes of this appeal. Claims 1-8, 10 and 19-20 are cancelled. Claims 9, 12-18, and 21-26 are the subject of the Final Rejection mailed August 24, 2004 and the Advisory Action mailed March 3, 2005. This rejection of claims 9, 12-18, and 21-26 is appealed and allowance of all claims is respectfully requested.

## IV. Status of Amendments

During prosecution of the present application, claims 9, 13, and 18 were amended and claims 1-8, 10, 11, 19, and 20 were cancelled. All amendments and evidence have been entered into the file.

According to an Advisory Action mailed March 3, 2005, Applicant's response to the Final Rejection including the supporting Second Declaration of Edward Joseph Cigallio were entered and considered, but deemed to not place the application in condition for allowance.

Thus, all amendments and declarations have been entered, including the first Declaration of Edward Joseph Cigallio (the First Cigallio Declaration), the Declaration of Richard Vincent Dougherty (the Dougherty Declaration), and Second Declaration of Edward Joseph Cigallio (the Second Cigallio Declaration).

## V. Summary of Claimed Subject Matter

### A. Independent Claim 9

Independent claim 9 of this application describes a system for making portion control sized packaged flowable liquid-containing condiments **58** in a portion size in the range from 1 to

5 ounces comprising a form/fill/seal apparatus **52** and a heat seal die **10** that includes longitudinal heat seal tubes **20 and 22** for substantially uniform heating of the die face **40** of the heat seal die. Specification p.4, ¶ 18 and 19.

More particularly, the system of amended claim 9 describes a heat sealable material feeder **54**, a flowable material feeder **56** for feeding a flowable liquid-containing condiment, and a form/fill/seal apparatus **52** structured and arranged for making portion control sized packages **58** so that the portion control sized package has a portion size in the range from 1 to 5 ounces. Specification, p. 4, ¶ 18. Specifically, this form/fill/seal apparatus **52** is structured and arranged for receiving the heat sealable material, forming a portion control sized package **58** with the heat sealable material, filling the portion control sized package with the flowable liquid-containing condiment in a portion size in the range from 1 to 5 ounces, and sealing the portion control sized package. Specification, p. 4, ¶ 18. The form/fill/seal apparatus **52** includes a heat seal die **10** comprising first and second heating elements **16 and 18** and first and second longitudinal heat tubes **20 and 22** disposed, respectively, in first and second die members **12 and 14**. Specification, p. 2, ¶ 10. The heat tubes **20 and 22**, which can also be described as heat pipes, are disposed between the heating element **16 and 18** and the die face **40** of each die member **12 and 14** for maintaining a substantially uniform heat seal temperature along the length of the die faces. Specification, p. 2, ¶ 14 and 15. The substantial uniformity of heat seal die temperature significantly decreases the occurrence of serum leakers, which are packages that leak liquid through the package seal. Specification, p. 4, ¶ 20. Second Cigallio Declaration, ¶ 5.

As explained in Applicants' specification, heat tubes (heat pipes) typically comprise a closed metal tube, a wick disposed in the tube, and liquid disposed in a portion of the remaining volume of the tube. As the temperature along the heat tube changes, the fluid in the hotter area

of the tube boils, picking up latent heat of vaporization. This high pressure travels to the lower pressure (cooler) area of the tube and condenses, thus transferring heat to the cooler area. This cycle in the heat tube equilibrates the temperature across the heat seal die members and keeps the temperature substantially uniform. See Specification, p. 3, ¶ 15; First Cigallio Declaration, ¶ 6.

#### B. Independent Claim 18

Independent claim 18 describes a corresponding method for making portion control sized packaged flowable liquid-containing condiments in a portion size in the range from 1 to 5 ounces. Specification p.4, ¶ 18 and 19. Second Cigallio Declaration, ¶ 4.

More particularly, the method of amended claim 18 describes a feeding a heat sealable material **60** and a flowable liquid-containing condiment to a form/fill/seal apparatus **52** structured and arranged for making portion control sized packages **58** so that the portion control sized package has a portion size in the range from 1 to 5 ounces. Specification, p. 4, ¶ 18 and 19. Next, a portion control sized package **58** is formed with the heat sealable material **60** and filled with the flowable liquid-containing condiment in a portion size in the range from 1 to 5 ounces. Specification, p. 4, ¶ 19. Then, the portion control sized package **58** is sealed with the heat seal die **10**. Specification, p. 4, ¶ 19.

#### VI. Grounds of Rejection to be Reviewed on Appeal

On August 24, 2004, the Examiner issued a Final Rejection of all pending claims of the application under 35 U.S.C. §103(a). In particular, the Examiner rejected Claims 9, 12-18 and 21-26 as being unpatentable over U.S. Patent 3,228,170 issued to Eisenstadt (the Eisenstadt Patent) in view of U.S. Patent 6,301,859 issued to Nakamura et al. (the Nakamura Patent). The Examiner cited the Eisenstadt Patent as disclosing all features of independent claims 9 and 18 of the application except the use of heat tubes in the die members. The Examiner reasoned that it

would have been obvious to one having ordinary skill in the art, at the time Applicants' invention was made, to modify the system disclosed in the Eisenstadt patent and incorporate the heat seal die as taught by the Nakamura patent providing an improved heat sealer effective to accomplish a uniform and proper temperature distribution in the seal contact faces to secure a sealing streak in the resulting seal.

A. Concise Statement of Each Ground of Rejection Presented for Review

Ground 1

Whether the cited prior art establishes a prima facie case of obviousness with regard to the rejected claims 9, 12-18, and 21-26.

Ground 2

Whether the invention described in claims 9, 12-18, and 21-26 would have been obvious over the cited prior art to one of ordinary skill in the art at the time such invention was made in view of the submitted evidence of secondary considerations.

VII. Argument

A. Background

Portion control sized packaging is packaging that controls the amount of packaged product provided to the end user. First Cigallio Declaration, ¶ 2. For example, condiments such as ketchup and mustard are packaged in portion control packages for use by fast-food consumers. Form/fill/seal machines for making portion control sized packages simultaneously seal the bottoms, and then the tops of several packages, as many as 12 or more packages at once. In this circumstance, uniform temperature, pressure, and dwell time across the flexible packaging material are critical. When sealing flexible packaging material to make portion control sized packaging, the two opposing faces of the flexible material must be heated to at least a

temperature at which the material softens, but not so high as to liquefy. The softened surfaces must be pressed together and maintained in intimate contact for a time sufficient to allow the entanglement of polymeric molecules across the interface separating the surfaces. As the sealed area cools, the entangled polymers effectively weld the two surfaces together, eliminating the previously separate surfaces and becoming a monolithic layer of material with thickness approximately equal to the sum of respective thickness of each of the two materials. This combination of pressure, temperature, and time of pressure application (dwell time) constitute the three basic variables used to control heat sealing processes. First Cigallio Declaration, ¶ 7.

In portion control packaging, narrow channel leaks can be formed when heat sealing flexible materials together to form the packages, particularly when the temperature along the length of the heat seal die is non-uniform such that the temperature in some areas falls below that required for adequate heat sealing. These narrow channel leaks can escape detection until after the portion control packages are packed and distributed in bags or cases. Channel leaks in portion control packages leak serum from the flowable material inside the packages and can contaminate the entire contents of bags or cases of portion control sized packages. First Cigallio Declaration, ¶ 8.

B. Ground 1

Question Presented for Review

Has the cited prior art established a prima facie case of obviousness with regard to the rejected claims 9, 12-18, and 21-26.

Applicants respectfully submit that it would not have been obvious to one of ordinary skill in the art at the time this invention was made to make portion control sized packaged



flowable liquid containing condiments with a form/fill/seal system incorporating a heat seal die comprising heat tubes. Applicants respectfully submit that the Eisenstadt patent and the Nakamura Patent do not establish a prima facie case of obviousness under §103 because the Nakamura Patent expressly teaches away from using heat tubes in heat sealing dies (see col. 9, l. 44 – col. 10, l. 27) such that there is no motivation to modify the teaching of the Eisenstadt patent to use heat tubes in the manufacture of portion control sized packaged condiments and there is no reasonable expectation of success in doing so. A prior art reference that teaches away from the claimed invention is a significant factor to be considered in determining obviousness and does not establish a prima facie case of obviousness. M.P.E.P § 2145; M.P.E.P § 2143; *In re Fine*, 873 F.2d 1071, 5 USPQ 2d 1596 (Fed. Cir. 1988).

The Eisenstadt patent discloses an automatic machine 20 for packaging liquids and semi liquids such as mustard and syrup in individual portion size heat seal packages 24. This machine 20 generally includes a heat sealable plastic film feeder, a fluid or semi fluid feeder 100 for feeding the fluid or semi fluid substance 27, and a form/fill/seal mechanism 40 for forming the packages. The form/fill/seal mechanism 40 includes heat sealing jaws (46 and 64) for sealing the edges of the pouches. Second Cigallio Declaration, ¶ 6.

The machine described in the Eisenstadt patent is a single lane form/fill/seal packaging machine meaning that it only forms one package at a time. The film fed through this machine is only wide enough to form one package at a time. The Eisenstadt patent does not disclose any detail regarding the structure of the heat sealing jaws or the manner of heating them. With a single lane, single serving packaging machine, the heat seal dies are small so that the temperature across the dies is easily kept uniform and serum leakers are not a problem. Serum leakers become a problem in multi-lane individual portion packaging machines because the heat seal dies

are much longer and maintaining uniform temperature along the die is more difficult. This problem is not appreciated in the Eisenstadt patent. Second Cigallio Declaration, ¶ 7.

The Nakamura Patent teaches conventional form/fill/seal packaging and does not relate to what is known in the industry as portion control size packaging of condiments. The Nakamura Patent teaches using heat sealing jaws comprising heat conducting members 33a and 33b, such as solid rods of copper having a high conductivity, instead of heat tubes or heat pipes as described in amended independent claims 9 and 18 of this application. Col. 8, l. 39-42. The heat seal jaws disclosed in the Nakamura Patent are not for portion control sized packaging as they are larger and include an integral cutter blade 30 and cutter groove 22 for simultaneously cutting flexible packaging upon heat sealing. The Nakamura Patent describes a concern with heat transfer through the depth of the heat seal dies from the heating element to the die face. The solution in the Nakamura Patent is to place the high conductivity solid copper rods between the heating elements and the die face of the heat sealing jaws. First Cigallio Declaration, ¶ 9.

The Nakamura Patent expressly teaches that heat tubes (heat pipes) should not be used in the heat sealing dies, taking the position that heat tubes do not distribute heat adequately in the radial direction. Col. 9, l. 44 - col.10, l.27. Figs. 11A and 11B of the Nakamura Patent illustrate a prior art heat seal die comprising heat tubes, but the specification of the Nakamura Patent teaches that heat tubes should not be used. First Cigallio Declaration, ¶ 10.

According to M.P.E.P. §2142, three basic criteria must be met to establish a *prima facie* case of obviousness. First, there must be some suggestion or modification, either in the references themselves or the knowledge generally available to one of ordinary skill in the art to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Third, the prior art reference (or references when combined) must teach or suggest all of the claim limitations. The teaching or suggestion to make the claim

combination and the reasonable expectation of success must both be found in the prior art, and not based on Applicants' disclosure. *In re Vaeck*, 947 F.2d 488 20 U.S.P.Q. F.2d 1438 (Fed. Cir. 1991). Furthermore, prior art that teaches away from the claimed invention demonstrates a lack of *prima facie* obviousness. *In re Hedges*, 783 F.2d 1038, 228 USPQ 685 (Fed. Cir. 1986); *In re Fine*, 873 F.2d 1078, 5USPQ 2<sup>nd</sup> 1596 (Fed. Cir. 1988).

None of the three basic criteria of *prima facie* obviousness are met here and applicants respectfully submit that the Eisenstadt Patent and the Nakamura Patent do not establish a *prima facie* case of obviousness against amended claims 9 and 18 of this application. First, there is no motivation to modify the Eisenstadt Patent to include heat tubes, because the Nakamura Patent actually teaches away from using heat tubes, does not suggest using heat tubes in portion control sized packaging systems, and certainly does not appreciate the problems particular to the smaller, thinner portion control sized packaging heat seal dies. With portion control sized packaging heat seal dies, there is little concern about heat transfer through the depth of the dies, as they are small and thin. Instead, the concern is uniformity of temperature along the long length of the dies. This problem is well addressed by Applicants' invention as defined in independent claims 9 and 18 of this application, while the Nakamura Patent does not address portion control sized packaging systems or this problem, and even teaches away from using heat tubes. Second Cigallio Declaration, ¶ 8.

Furthermore, there would have been no reasonable expectation of success to one of ordinary skill in the art at the time the invention was made in view of the Nakamura Patent which clearly teaches not using heat tubes in heat seal dies. The Nakamura Patent describes heat tubes as inadequate in heat sealing. Perhaps that is true for the heat dies described in the Nakamura Patent, but Applicants' have shown that it is very effective in heat seal dies for portion control condiment form/fill/seal packaging systems. First Cigallio Declaration, ¶ 13.

The technology of claims 9 and 18 encompasses a preferred embodiment wherein multi-lane portion control packaging machinery system makes many (equal to the number of lanes) pouches with each cycle of product delivery. This multi-lane, multi-pouch production cycle efficiently produces portion control condiments. The subject matter of claims 9 and 18 provides consistent seal integrity across multiple lanes of this machinery. In contrast, the Nakamura Patent teaches that heat tubes do not adequately maintain an acceptable longitudinal temperature variation (i.e. in the direction "X" as indicated in Figure 1A) for heat-seal jaws (Column 9; lines 44-67). In fact, multi-lane portion control packaging machinery has heat-seal jaws with much less depth (Dimension "Y" in Figure 1b) than the packaging machinery described in the Nakamura Patent. First Cigallio Declaration, ¶ 16.

In the Examiner's Response to Arguments set forth in the Office Action, the Examiner explains that the embodiments in Figs. 11A-B of the Nakamura patent illustrating heat tubes remain pertinent prior art despite any teaching away from using such embodiments in the Nakamura patent. Applicants do not dispute that the Nakamura patent is pertinent prior art. Applicants submit that the Nakamura patent is prior art that teaches away from using heat tubes in portion control packaging manufacturing and is a disincentive to one of ordinary skill in the art to combine the embodiments in the Nakamura patent illustrating heat tubes with the system disclosed in the Eisenstadt reference. The rejection in this Office Action is one of obviousness under 35 U.S.C. § 103. Particularly, the Examiner takes the position that it would have been obvious to combine the teachings of heat tubes in the Nakamura patent with the Eisenstadt patent. Applicants are not arguing that the Nakamura patent is non-analogous art. Applicants position is that the combination of the Nakamura patent and the Eisenstadt patent does not establish a prima facie case of obviousness because the Nakamura patent teaches away from combining heat tube technology with a form/fill/seal machine and therefore teaches away from

combining the Nakamura patent with the Eisenstadt patent. Because of this teaching away, there is no motivation to one of ordinary skill in the art to make such a combination. Second Cigallio Declaration, ¶ 9.

Furthermore, the Eisenstadt patent is a single lane, individual serving form/fill/seal packaging machine and therefore the heat seal dies are small, so that the temperature across the dies is easily kept uniform and serum leakers are not a problem. Serum leakers become a problem in multi-lane individual portion form/fill/seal packaging machines because the heat seal dies are much longer and maintaining uniform temperatures along the dies is more difficult. This problem is not appreciated in the Eisenstadt patent. Thus, there is no motivation to address the problem and combine the Nakamura patent with the Eisenstadt patent. Second Cigallio Declaration, ¶ 10.

Combination of the Nakamura patent with the Eisenstadt patent is mere hindsight reconstruction. Although patent examination is necessarily conducted after an invention is made “the combination of elements from non-analogous sources in a manner that reconstructs the Applicant’s invention only with the benefit of hindsight is insufficient to present a *prima facie* case of obviousness.” In re *Oetiker*, 977 F.2d at 1445-1447, 24 USPQ 2<sup>nd</sup> at 1446 (Fed. Cir. 1992).

The criteria of *prima facie* obviousness are therefore not met by the combination of the Eisenstadt and Nakamura Patents.

#### C. Ground 2

##### Question Presented for Review

Would the invention described in claims 9, 12-18, and 21-26 have been obvious over the cited prior art to one of ordinary skill in the art at the time such invention was made in view of the submitted evidence of secondary considerations.

Applicant has submitted substantial evidence of secondary considerations indicating nonobviousness of the subject matter in independent claims 9 and 18. When evidence is submitted, such secondary considerations must be considered by the Examiner. MPEP § 2144.08(B); *Graham v. John Deere*, 383 US1, 17, 86 Supreme Court 684, 694, 148 USPQ 459, 467 (1966); *Simmons Fastener Corp. v. Illinois Tool Works*, 739 F.2d 1573, 1575, 22 USPQ 744, 746 (Fed. Cir. 1984). Such secondary considerations include, but are not limited to, unexpectedness of the results of the claimed invention to those skilled in the art; a long felt but unsatisfied need for the claimed invention while the needed implementing arts and elements have long been available; commercial success of the invention causally related to the invention itself, rather than to companion factors such as advertising or attractive packaging; replacement in the industry of prior art devices by the patented invention; acquiescence by the industry to the patent's validity by taking licenses under the patent; and teaching away from the technical direction in which the patentee went by those skilled in the art. *Graham v. John Deere* at 148 USPQ 467.

*Unexpected Results*

Embodiments of the invention encompassed by independent claims 9 and 18 demonstrate unexpectedly superior results over prior art devices. Generally, during heat sealing of portion control packaged condiments, the temperature variation across heat seal dies made in accordance with embodiments encompassed by independent claim 9 of this invention are substantially less than the temperature variation across heat seal dies made in accordance with the prior art (without heat tubes). First Cigallio Declaration, ¶ 17.

Figures 1 and 2, below, are graphic representations of temperature distribution across the top and bottom sealing bars on a type of portion control sized condiment packaging machine

called a multi-lane four-side seal pouch machine. Figure 1 illustrates a prior art form/fill/seal machine and Figure 2 illustrates an embodiment of the present invention, as described by claims 9 and 18 of this application. During actual commercial production, the prior art machine shows a temperature difference of 23 degrees F across the front sealing bar of the heat seal die and a 31 degree F difference across the back sealing bar of the heat seal die. Such variation across the width of these seal bars can result in insufficient heating and sealing of the pouches. As can be seen in Figure 2, with an embodiment of the present invention, these differences drop to 8 and 4 degrees F, respectively. First Cigallio Declaration, ¶ 18.

The heat seal die of the prior art machine was made of steel and did not include heat tubes. The heat seal die of the invention embodiment was made of hardened 440 stainless steel and included heat tubes. First Cigallio Declaration, ¶ 19.

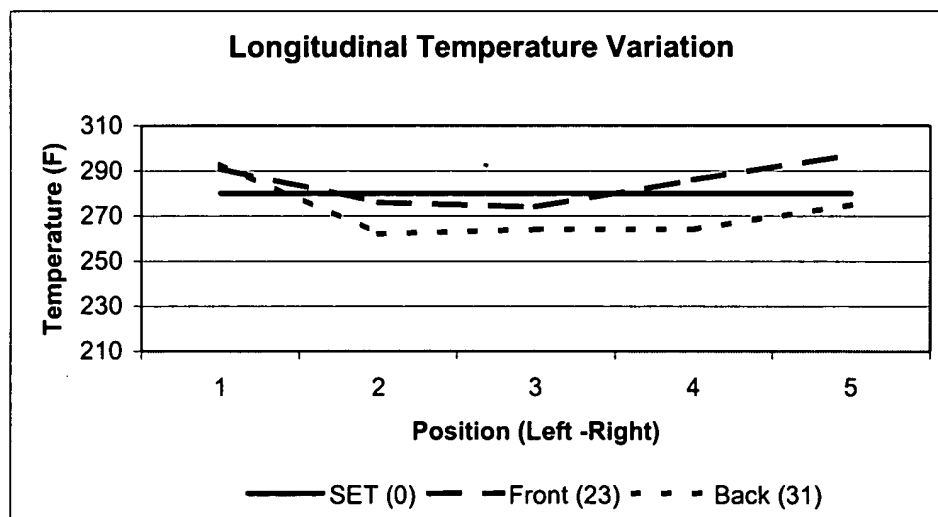
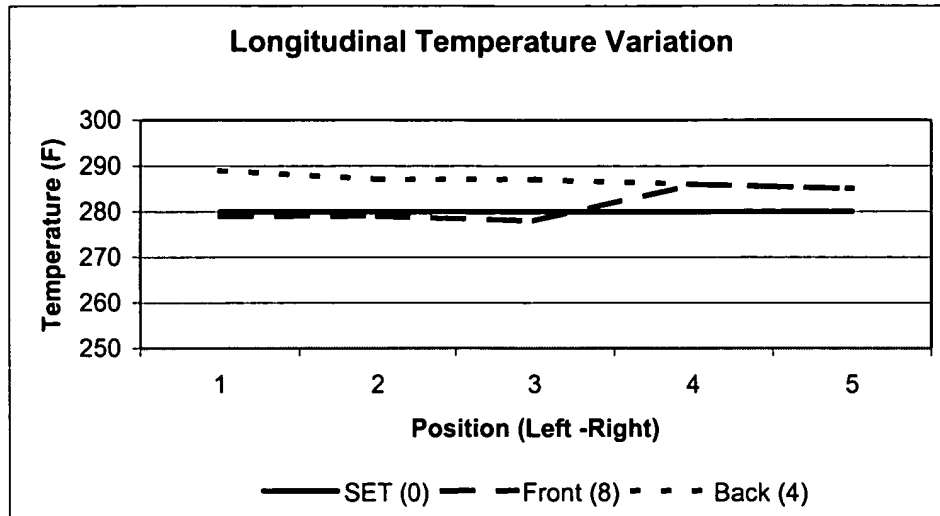


Figure 1: Operating Profile Without Invention



**Figure 2: Operating Profile With Invention**

Applicants submit again for consideration the unexpected results illustrated in Figure 2 hereinabove as evidence of nonobviousness. These results are particularly unexpected in view of the disclosure in the Nakamura Patent, which teaches that heat tubes are inadequate for controlling temperature in heat seal dies. First Cigallio Declaration, ¶ 20.

Commercial application of embodiments of this invention have also been unexpectedly successful. Golden States Foods (GSF) is a licensee under this patent application and uses form/fill/seal machines for manufacturing portion control packaged condiments such as ketchup. GSF is the largest supplier of liquid products to McDonald's restaurants. First Cigallio Declaration, ¶ 21.

In January 2002, the owner of this patent application, Printpack, in conjunction with GSF, installed embodiments of the invention encompassed by claims 9 and 18 of this application in a GSF liquid products plant in Conyers, Georgia. The embodiments implemented by Printpack and GSF were multi-lane, four side form/fill/seal machines for making portion control packaged condiments equipment with hardened stainless steel cross heat seal dies including longitudinal heat tubes (hereinafter the Embodiments). Prior to implementation of these Embodiments, GSF



operated this form/fill/seal machines with cross heat seal dies made of steel and lacking heat tubes. (the Prior Art Machines). First Cigallio Declaration, ¶ 22.

The Prior Art Machines operated by GSF exhibited temperature variations exceeding 60°F across the cross heat seal dies, while specifications for the packaging film used normally set a 20°F variation. Such a discrepancy between film specifications for heat seal die temperature variation and actual cross heat seal die temperature variation in the Prior Art Machines reduced the seal integrity of the portion control packaging and increased the number of serum leakers. First Cigallio Declaration, ¶ 23.

The Embodiments installed and implemented at GSF in January 2002 reduced the temperature variation across the cross heat seal dies to less than 10°F and thereby significantly enhanced the cross seal integrity of the portion control packaging produced. As a result, the number of cases of portion control packaged condiments withheld from distribution by GSF due to serum leakers dropped by 79% and labor necessary to rework such withheld cases dropped by about \$75,000 annually. The reduction in serum leakers also enhanced the quality of product delivered to GSF's customers. First Cigallio Declaration, ¶ 24.

Thus, the success of GSF in commercially operating embodiments of this invention is further evidence of the nonobviousness of the subject matter in claims 9 and 18 of this application.

*Long Felt, But Unsatisfied Need*

Reducing serum leakers in portion controlled packaged condiments has been a long felt, but unsatisfied need in the condiment packaging. First Cigallio Declaration, ¶ 25. The publication titled "Portion Control and Flexible Packaging: A Reference Manual for the Dressings & Sauces Industry First Edition;" (The Association of Dressings & Sauces; August 1999; Atlanta, Ga; 150 pages) (hereinafter the "Manual") provides guidelines for portion control

packaging of liquid containing materials such as condiments and sauces. Applicants submit herewith this entire publication. This Association of Dressings & Sauces serves the market at which the invention described in the present application is directed. The Manual generally indicates that serum leakers are considered a serious problem in the portion control packaging industry. See *Manual*, pages 132-137. The Manual advises as follows:

“Packaging films have changed dramatically over the last 20 years, yet serum leakers were there then and they are still here now. Studies have been done varying sealant materials and sealant thickness along with packaging machine conditions.”

See *Manual*, page 134.

The Manual speculates that “gathering of the film and subsequent wrinkles may be the cause of most serum leakers.” See *Manual* page 132. The *Boeckmann* patent cited in the Office Action also focuses on wrinkles as the source of the problem. The Manual suggests that portion control packaging machines must be maintained very diligently to minimize serum leakers. See *Manual*, page 134.

In “Table 8-4-Leaker analysis for Problem Solving”, the Manual describes seven (7) types of defects from leaking, three (3) of which involve seal area faults.

Observed Defect	Possible Cause	Pattern	Action
Unsealed Seam Areas [5 of 7] 1)	Inadequate amount of sealant	No bonding in seal area. Gaps or spaces in seam	Confirm thickness of sealant layer against specification
2)	Defective composition of sealant layer	Reduced bond strength in seal area. Seam degenerates over storage	Packaging material defect
3)	Sealing temperature too low on sealing bars	No bonding in seal area. Leakers occur in same lane of equipment	Test and verify temperatures of heat seal bars. Replace units as needed
4)	Inadequate pressure on sealing bars, or poor mating of sealing bars	Reduced bond strength in seal area. Leakers will occur in repeat locations	Verify pressure with pressure sensitive paper. Replace springs as needed
5)	Inadequate dwell time on sealing bars	Reduced bond strength in seal area. Leakers occur in repeat locations	Reduce operating speeds. Timing adjustment
Cracks in seal area. [6 of 7]	Excessive pressure on sealing bars	1) Small breaks across seal area, or localized 2) Melted appearance or fracturing at seams	1) Adjust equipment. 2) Reduce and verify sealing bar temperatures
Serum Leakers after 30 days [7 of 7]	Excessive heat or pressure on the package in storage may contribute to serum leaker occurrence from any cause	Serum leakage from package during storage. Very small seam interruption	Reduce storage effect if possible. Increase grade of corrugated material if needed.

Manual, Pp. 80-82

The *Manual* is a current summary of industry beliefs and practices presents conflicting views on the causes of and remedies for leakers in multi-lane portion control packages. High temperatures and pressures are implicated in some cases (Table 8-4, 5.3, 5.5, and 6.2), while Appendix A No. 4 blames low temperatures and pressures. The one potentially consistent remedy, “reduce operating speed” (Table 8-4, 6.2) is not an economical option. While mention is made about “adjusting” and maintaining the performance of the packaging machinery components, no consideration is given to the ability of the machinery to maintain the tolerances

necessary to prevent leakers and there is no recognition that uniformity of temperature across the heat seal die causes leakers. First Cigallio Declaration, ¶ 28.

Furthermore, according to cited U.S. Patent 3,677,329 issued to *Kirkpatrick*, heat tubes have been available for over thirty years, but to Applicants' knowledge, they have not been implemented in portion control sized packaging heat seal dies until Applicants' invention. This could be due to the prior understanding in the art that heat tubes will be unsuitable, as taught by the *Nakamura* Patent. First Cigallio Declaration, ¶ 29.

The long felt need for reducing serum leakers in portion control size packaged condiments is finally satisfied by the invention described in the claims of the present application. The combination of the long felt need for reducing serum leakers and the concurrent availability of heat tubes and other endeavors establishes the nonobviousness of the system and method for portion control size packaging described in the independent claims of this application. Applicants respectfully submit that with this evidence of nonobviousness, the obviousness rejection based on *Nakamura* and *Boeckmann* is overcome.

*Commercial Success, Licenses, and Replacement of Prior Art Devices*

The owner of the Application, Printpack, currently has licensed this technology to two producers of portion control-packaged condiments: C.F. Sauer, Mauldin, SC (CFS) and Golden States Foods, Conyers, GA (GSF). Both of these companies produce portion control-packaged condiments for a variety of fast food restaurants. Dougherty Declaration, ¶ 3.

The licenses referenced above are contingent on the sale of specified amounts of packaging material sales by Printpack to the licensees over the next several years. Under the licenses, Printpack replaced the existing heat seal dies in the licensee's form/fill/seal machines for production of portion control sized packaging and supplies 60% of the licensees packaging

material volume for portion control packaging at the same price provided by competitors. In these cases, Printpack and the licensees cooperated in experiments that demonstrated the effectiveness of the technology. The licensing arrangements were made due to direct contact by Printpack representatives with the licensees. Printpack's advertising of the claimed invention was limited to this direct contact. Therefore, the commercial success of the claimed invention is not due to pricing or advertising, but rather, the technology itself. Dougherty Declaration, ¶ 4.

This commercial success, including the licensing of the technology and the replacement of prior art machines and operation with embodiments of this invention, is further evidence of the nonobviousness of the subject matter of claims 9 and 18 of this application.

*Prior Art Teaches Away*

Lastly, as explained in detail hereinabove, the fact that those skilled in the art taught away from the use of heat tubes in heat seal applications according to the Nakamura patent is still more evidence of nonobviousness of the subject matter of independent claims 9 and 18.

Applicants respectfully submit that the evidence of the non-obviousness of claims 9 and 18 is overwhelming.

In conclusion, the cited prior art does not establish a prima facie case of obviousness with regard to independent claims 9 and 18 of the application, and even if it did, Applicants' evidence of secondary considerations is overwhelming and warrants a finding of non-obviousness. Accordingly, all claims are allowable over the cited art and Applicants respectfully petition the Board to overrule the Examiner's final rejection and order the allowance of all claims.

VIII. Claims Appendix

The appendix containing a copy of the claims involved in the appeal can be found on page 21.

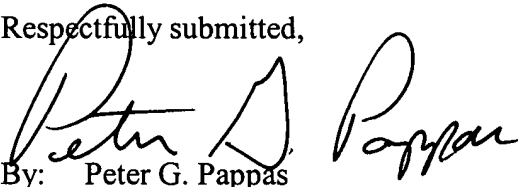
IX. Evidence Appendix

The appendix containing copies of evidence submitted pursuant to 37 C.F.R. §1.132 can be found on page 27.

X. Related Proceedings Appendix

There are no appeals or interferences related to the appeal of the present application.

Respectfully submitted,

  
By: Peter G. Pappas  
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Attorney Docket No.: 17244-0129

APPENDIX 1 - CLAIMS ON APPEAL

1-8. (Previously cancelled).

9. (Previously amended) A system for making portion control sized packaged flowable liquid-containing condiments in a portion size in the range from 1 to 5 ounces comprising:

a heat sealable material feeder;

a flowable material feeder for feeding a flowable liquid-containing condiment;

and

a form/fill/seal apparatus structured and arranged for receiving the heat sealable material, forming a portion control sized package with the heat sealable material, filling the portion control sized package with the flowable liquid-containing condiment in a portion size in the range from 1 to 5 ounces, and sealing the portion control sized package so that the portion control sized package has a portion size in the range from 1 to 5 ounces, the form/fill/seal apparatus including a heat seal die comprising:

a first die member having a longitudinal axis and a die face;

a second die member having a longitudinal axis and a die face;

a first heating element engaged with the first die member for heating the first die member;

a second heating element engaged with the second die member for heating the second die member;

a first longitudinal heat tube tightly disposed in a first longitudinal bore in the first die member between the first heating element and the die face of the first die member for maintaining a substantially uniform heat seal temperature along the die face of the first die member; and

a second longitudinal heat tube tightly disposed in a first longitudinal bore in the second die member between the second heating element and the die face of the second die member for maintaining a substantially uniform heat seal temperature along the die face of the second die member.

10. (Cancelled)

11. (Cancelled)

12. (Original)            A system as in claim 9 wherein the die face of the first die member has at least one longitudinal land and the second die member has at least one longitudinal groove for receiving the at least one longitudinal land in a mating arrangement.

13. (Previously amended)            A system as in claim 9 wherein the die face of the first die member has a plurality of alternating lands and grooves and the die face of the second die member has a plurality of alternating lands and grooves, the lands and grooves of the first die member and the lands and grooves of the second die member structured and arranged for selective mating arrangement.

14. (Original)            A system as in claim 9 wherein:  
                 the first die member extends along the longitudinal axis of the first die member from a first end to a second end and the first longitudinal heat tube extends from the first end of the first die member to the second end of the first die member; and  
                 the second die member extends along the longitudinal axis of the second die member from a first end to a second end and the second longitudinal heat tube extends from the first end of the second die member to the second end of the second die member.

15. (Original)            A system as in claim 9 wherein:  
                 the first die member has first and second longitudinal sides and a raised portion extending from between the first and second longitudinal sides, the raised portion of the first die member including the die face of the first die member and sloping walls extending from respective first and second sides to the die face of the first die member; and  
                 the second die member has first and second longitudinal sides and a raised portion extending from between the first and second longitudinal sides, the raised portion of the second die member including the die face of the second die member and sloping walls extending from respective first and second sides to the die face of the second die member.



16. (Original) A system as in claim 9 wherein:

the first die member has an upwardly facing first longitudinal side, a downwardly facing second longitudinal side, and a temperature sensor disposed in the downwardly facing second longitudinal side; and

second first die member has an upwardly facing first longitudinal side, a downwardly facing second longitudinal side, and a temperature sensor disposed in the downwardly facing second longitudinal side.

17. (Original) A system as in claim 9 wherein the first heating element is a heating cartridge disposed in a second longitudinal bore in the first die member and the second heating element is a heating cartridge disposed in a second longitudinal bore in the second die member.

18. (Previously amended) A method for making portion control sized packaged flowable liquid-containing condiments in a portion size in the range from 1 to 5 ounces comprising:

feeding heat sealable material and a flowable liquid-containing condiment to a form/fill/seal apparatus structured and arranged for making portion control sized packages of the condiment in a portion size in the range from 1 to 5 ounces and comprising a heat seal die;

forming a portion control sized package with the heat sealable material;

filling the portion control sized package with the flowable liquid-containing condiment in a portion size in the range from 1 to 5 ounces; and

sealing the portion control sized package with the heat seal die so that the portion control sized package has a portion size in the range from 1 to 5 ounces,

the heat seal die comprising:

a first die member having a longitudinal axis and a die face;

a second die member having a longitudinal axis and a die face;

a first heating element engaged with the first die member for heating the first die member;

a second heating element engaged with the second die member for heating the second die member;

a first longitudinal heat tube tightly disposed in a first longitudinal bore in the first die member between the first heating element and the die face of the first die member for maintaining a substantially uniform heat seal temperature along the die face of the first die member; and

a second longitudinal heat tube tightly disposed in a first longitudinal bore in the second die member between the second heating element and the die face of the second die member for maintaining a substantially uniform heat seal temperature along the die face of the second die member.

19. (Cancelled)

20. (Cancelled)

21. (Original) A method as in claim 18 wherein the die face of the first die member has at least one longitudinal land and the second die member has at least one longitudinal groove for receiving the at least one longitudinal land in a mating arrangement.

22. (Original) A method as in claim 20 wherein the die face of the first die member has a plurality of alternating lands and grooves and the die face of the second die member has a plurality of alternating lands and grooves, the lands and grooves of the first die member and the lands and grooves of the second die member structured and arranged for selective mating arrangement.

23. (Original) A method as in claim 18 wherein:  
the first die member extends along the longitudinal axis of the first die member from a first end to a second end and the first longitudinal heat tube extends from the first end of the first die member to the second end of the first die member; and  
the second die member extends along the longitudinal axis of the second die member from a first end to a second end and the second longitudinal heat tube extends from the first end of the second die member to the second end of the second die member.

24. (Original) A method as in claim 18 wherein:  
the first die member has first and second longitudinal sides and a raised portion extending from between the first and second longitudinal sides, the raised portion of the first die member including the die face of the first die member and sloping walls extending from respective first and second sides to the die face of the first die member; and  
the second die member has first and second longitudinal sides and a raised portion extending from between the first and second longitudinal sides, the raised portion of the second die member including the die face of the second die member and sloping walls extending from respective first and second sides to the die face of the second die member.

25. (Original) A method as in claim 18 wherein:  
the first die member has an upwardly facing first longitudinal side, a downwardly facing second longitudinal side, and a temperature sensor disposed in the downwardly facing second longitudinal side; and  
second first die member has an upwardly facing first longitudinal side, a downwardly facing second longitudinal side, and a temperature sensor disposed in the downwardly facing second longitudinal side.

26. (Original) A method as in claim 18 wherein the first heating element is a heating cartridge disposed in a second longitudinal bore in the first die member and the second heating element is a heating cartridge disposed in a second longitudinal bore in the second die member.

APPENDIX 2 – EVIDENCE

Included in this Appendix are three declarations submitted under 37 C.F.R. § 1.132 and entered into the record by the Examiner. These declarations are: (1) the first Declaration of Edward Joseph Cigallio (the First Cigallio Declaration), mailed on October 1, 2003 and received on October 6, 2003; (2) the Declaration of Richard Vincent Dougherty (the Dougherty Declaration), mailed on October 1, 2003 and received on October 6, 2003; and (3) the Second Declaration of Edward Joseph Cigallio (the Second Cigallio Declaration), mailed on February 9, 2005 and received on February 14, 2005.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

James Robert Adair, Jr. et al.

Serial No. 09/954,443

Filing Date: September 17, 2001

For: Heat Seal Die and System and Method  
For Portion Control Sized Packaging

Examiner: Thanh K. Truong

Art Unit: 3721

DECLARATION UNDER 37 C.F.R. § 1.132

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

I, Richard Vincent Dougherty, hereby declare that:

1. I am a co-inventor of the above-identified patent application (the "Patent Application"). I am currently employed by Printpack, Inc., a leading provider of printed flexible technology and products, as a Marketing Manager in the (developing of/sales and marketing of) printed flexible packaging and manufacturing systems. I have 23 years experience working in the field of printed flexible packaging. I have a degree in Fine Arts from Miami University in Oxford, Ohio.
2. I am familiar with the above-referenced patent application (hereinafter the Application) and the invention (hereinafter the Invention) disclosed therein. My work in connection with this Invention began as an effort to solve the problem of serum leakers in portion control packages formed by heat sealing in a form/fill/seal machine. Portion control sized packages are relatively small portions of material in flexible, single serve packages designed to control the portion of the material consumed by the end user. Condiments such as ketchup and mustard served in flexible,

single serve packages in fast food restaurants are examples of common portion control size packaged liquid-containing materials. Serum leakers are portion control packages that leak liquid through the heat seal of the packages.

3. The owner of the Application, Printpack, currently has licensed the technology to two producers of portion control-packaged condiments: C.F. Sauer, Mauldin, SC (CFS) and Golden States Foods, Conyers, GA (GSF). Both of these companies produce portion control-packaged condiments for a variety of fast food restaurants.


4. The licenses referenced above are contingent on the sale of specified amounts of packaging material sales by Printpack to the licensees over the next several years. Under the licenses, Printpack replaced the existing heat seal dies in the licensees' form/fill/seal machines for production of portion control sized packaging and supplies 60% of the licensees packaging material volume for portion control packaging at the same price provided by competitors. In these cases, Printpack and the licensees cooperated in experiments that demonstrated the effectiveness of the technology. The licensing arrangements were made due to direct contact by Printpack representatives with the licensees. Printpack's advertising of the claimed invention was limited to this direct contact. Therefore, the commercial success of the claimed invention is not due to pricing or advertising, but rather, the technology itself.

5. I declare that all statements made herein of my own knowledge and belief are true and that all statements made on information and belief are believed to be true, and further that the statements are made with the knowledge that willful false statements are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such

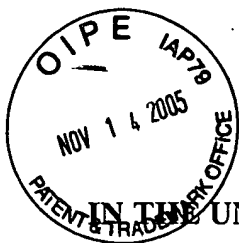
U.S.S.N. 09/954,443  
Filed: September 17, 2003  
DECLARATION UNDER 37 C.F.R. § 1.132

willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Date: September 17, 2003

  
Richard Vincent Dougherty





IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

**James Robert Adair, Jr. et al.**

Serial No. **09/954,443**

Filing Date: **September 17, 2001**

For: **Heat Seal Die and System and Method  
For Portion Control Sized Packaging**

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Examiner: **Thanh K. Truong**

Art Unit: 3721

**DECLARATION UNDER 37 C.F.R. § 1.132**

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Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

I, Edward Joseph Cigallio, hereby declare that:

1. I am a co-inventor of the above-identified patent application (the "Patent Application"). I am currently employed by Printpack, Inc., a leading provider of printed flexible technology and products, as a Packaging Systems Manager developing printed flexible packaging and manufacturing systems. I have 10 years experience working in the field of printed flexible packaging, and previously worked as a manufacturing engineer improving process and mechanical efficiencies. I have a degree in mechanical engineering from the University of Kentucky.

2. My work in connection with this invention began as an effort to solve the problem of serum leakers in portion control packages formed by heat sealing in a form/fill/seal machine. Portion control sized packages are relatively small portions of material in flexible, single serve packages designed to control the portion of the material consumed by the end user. Condiments

such as ketchup and mustard served in flexible, single serve packages in fast food restaurants are examples of common portion control size packaged liquid-containing materials. Serum leakers are portion control packages that leak liquid through the heat seal of the packages.

3. It is my understanding that Claims 9-26 of this application, including independent claims 9 and 18, are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 6,301,859 issued to Nakamura et al. (the Nakamura Patent) in view of U.S. Patent 4,896,048 issued to Boeckmann (the Boeckmann Patent).

4. I am very familiar with the printed flexible packaging systems and products. I am familiar with the is patent application and have reviewed the substantive Office Actions in this application and the prior art cited by the Examiner in the substantive Office Actions, including the Nakamura Patent and the Boeckmann Patent.

5. The system of claim 9 of this application describes a heat sealable material feeder, a flowable material feeder for feeding a flowable liquid-containing material, and a form/fill/seal apparatus structured and arranged for making portion control sized packages. Specifically, this form/fill/seal apparatus is structured and arranged for receiving the heat sealable material, forming a portion control sized package with the heat sealable material, filling the portion control sized package with the flowable liquid-containing material, and sealing the portion control sized package. The form/fill/seal apparatus includes a heat seal die comprising first and second heating elements and first and second longitudinal heat tubes disposed, respectively, in first and second die members. The heat tubes, which can also be described as heat pipes, are disposed between the heating element and the die face of each die member for maintaining a

substantially uniform heat seal temperature along the length of the die faces. The substantial uniformity of heat seal die temperature significantly decreases the occurrence of serum leakers, which are packages that leak liquid through the package seal.

6. Heat tubes (heat pipes) typically comprise a closed metal tube, a wick disposed in the tube, and liquid disposed in a portion of the remaining volume of the tube. As the temperature along the heat tube changes, the fluid in the hotter area of the tube boils, picking up latent heat of vaporization. This high pressure travels to the lower pressure (cooler) area of the tube and condenses, thus transferring heat to the cooler area. This cycle in the heat tube equilibrates the temperature across the heat seal die members and keeps the temperature substantially uniform.

7. Form/fill/seal machines for making portion control sized packages simultaneously seal the bottoms, and then the tops of several packages, as many as 12 or more packages at once. In this circumstance, uniform temperature, pressure, and dwell time across the flexible packaging material are critical. When sealing flexible packaging material to make portion control sized packaging, the two opposing faces of the flexible material must be heated to at least a temperature at which the material softens, but not so high as to liquefy. The softened surfaces must be pressed together and maintained in intimate contact for a time sufficient to allow the entanglement of polymeric molecules across the interface separating the surfaces. As the sealed area cools, the entangled polymers effectively weld the two surfaces together, eliminating the previously separate surfaces and becoming a monolithic layer of material with thickness approximately equal to the sum of respective thickness of each of the two materials. This

combination of pressure, temperature, and time of pressure application (dwell time) constitute the three basic variables used to control heat sealing processes.

8. In portion control packaging, narrow channel leaks can be formed when heat sealing flexible materials together to form the packages, particularly when the temperature along the length of the heat seal die is non-uniform such that the temperature in some areas falls below that required for adequate heat sealing. These narrow channel leaks can escape detection until after the portion control packages are packed and distributed in bags or cases. Channel leaks in portion control packages leak serum from the flowable material inside the packages and can contaminate the entire contents of bags or cases of portion control sized packages.

9. The Nakamura Patent teaches conventional form/fill/seal packaging and does not relate to what is known in the industry as portion control size packaging. The Nakamura Patent teaches using heat sealing jaws comprising heat conducting members 33a and 33b such as solid rods of copper having a high conductivity, instead of heat tubes or heat pipes as described in amended independent claims 9 and 18 of this application. Col. 8, l. 39-42. The heat seal jaws disclosed in the Nakamura Patent are not for portion control sized packaging as they are larger and include an integral cutter blade 30 and cutter groove 22 for simultaneously cutting flexible packaging upon heat sealing. The Nakamura Patent describes a concern with heat transfer through the depth of the heat seal dies from the heating element to the die face. The solution in the Nakamura Patent is to place the high conductivity solid copper rods between the heating elements and the die face of the heat sealing jaws.

10. The Nakamura Patent expressly teaches that heat tubes (heat pipes) should not be used in the heat sealing dies, taking the position that heat tubes do not distribute heat adequately in the radial direction. Col. 9, l. 44 - col.10, l.27. Figs. 11A and 11B of the Nakamura Patent illustrate a prior art heat seal die comprising heat tubes, but the specification of the Nakamura Patent teaches that heat tubes should not be used.

11. The Boeckmann Patent does not relate to the use of heat tubes (heat pipes) or heat conducting members in heat sealing jaws, but rather, addresses the problem of package leaks formed by stretching the plastic film when heat sealing to reduce wrinkling. According to the Boeckmann Patent, reducing wrinkling of the film reduces leaks in the packaging.

12. There is no motivation to combine the Nakamura Patent and Boeckmann Patent, because the Nakamura Patent actually teaches away from using heat tubes, does not suggest using heat tubes in portion control sized packaging systems, and certainly does not appreciate the problems particular to the smaller, thinner portion control sized packaging heat seal dies. With portion control sized packaging heat seal dies, there is little concern about heat transfer through the depth of the dies, as they are small and thin. Instead, the concern is uniformity of temperature along the long length of the dies. This problem is well addressed by Applicants' invention as defined in independent claims 9 and 18 of this application, while the Nakamura Patent does not address portion control sized packaging systems or this problem, and even teaches away from using heat tubes.

13. There would have been no reasonable expectation of success to one of ordinary skill in the art at the time the invention was made in view of the Nakamura Patent which clearly

teaches not using heat tubes in heat seal dies. The Nakamura Patent describes heat tubes as inadequate in heat sealing. Applicants' have shown that heat tubes are very effective in heat seal dies for portion control form/fill/seal packaging systems.

14. The combination of the Nakamura Patent and Boeckmann Patent does not result in the invention described in independent claims 9 and 18. The Boeckmann Patent solves heat seal packaging leaks by stretching the plastic film during heat sealing to reduce wrinkling. The Boeckmann Patent makes no reference to portion control sized packaging or equipment for making portion control sized packaging and does not suggest using heat tubes to solve the problem addressed by Applicant's invention. Accordingly, the Boeckmann Patent does not add the shortcomings of the Nakamura Patent.

15. The Nakamura Patent, at col. 1, lines 13-55, describes "weighing and packaging... each article M...[where e]ach article M may be one or a quantity of edible or non-edible items, for example, potato chips, fruits, candies, vegetables, screws, nails, bolts or other things desired or required to be bagged." As such, the packaging system description includes a lengthy list of machinery components to deliver and weigh the kind of *discreet* articles provided as examples: dispensing feeder of...inverted conical shape; vibratory hoppers; pool hopper; weighing cells; control device...to select a combination of some or all of the weighing hoppers; and gates of some or all of the weighing hoppers.

16. The portion control packaging machinery system encompassed by Applicants' claims differs from that in Nakamura in significant ways. In particular, the system and method of Applicants' claims 9 and 18 packages product comprising not several *discreet items* (the sum

of whose weight equals a specified amount), but rather a *liquid-containing material*, of higher or lower viscosity as the case may be. The amount of product packaged depends on volume, not weight. As a result, the process used to deliver product to each package use on volumetric displacement, not weighing cells. The packaging machinery in Figure 10 of the Nakamura Patent produces one bag filled with article "M" with each cycle described in the text cited. The technology of claims 9 and 18 encompasses a preferred embodiment wherein multi-lane portion control packaging machinery system makes many (equal to the number of lanes) pouches with each cycle of product delivery. This multi-lane, multi-pouch production cycle efficiently produces portion control liquid containing products such as condiments. The subject matter of claims 9 and 18 provides consistent seal integrity across multiple lanes of this machinery. In contrast, the Nakamura Patent teaches that heat tubes do not adequately maintain an acceptable longitudinal temperature variation (i.e. in the direction "X" as indicated in Figure 1A) for heat-seal jaws (Column 9; lines 44-67). In fact, multi-lane portion control packaging machinery has heat-seal jaws with much less depth (Dimension "Y" in Figure 1b) than the packaging machinery described in the Nakamura Patent.

17. Embodiments of the invention encompassed by independent claims 9 and 18 demonstrate unexpectedly superior results over prior art devices. Generally, during heat sealing of portion control packaging, the temperature variation across heat seal dies made in accordance with embodiments encompassed by independent claim 9 of this invention are substantially less than the temperature variation across heat seal dies made in accordance with the prior art (without heat tubes).

18. Figures 1 and 2, below, are graphic representations of temperature distribution across the top and bottom sealing bars on a type of portion control sized packaging machine called a multi-lane four-side seal pouch machine. Figure 1 illustrates a prior art form/fill/seal machine and Figure 2 illustrates an embodiment of the present invention, as described by claims 9 and 18 of this application. During actual commercial production, the prior art machine showed a temperature difference of 23 degrees F across the front sealing bar of the heat seal die and a 31 degree F difference across the back sealing bar of the heat seal die. Such variation across the width of these seal bars can result in insufficient heating and sealing of the pouches. As can be seen in Figure 2, with an embodiment of the present invention, these differences dropped to 8 and 4 degrees F, respectively.

19. The heat seal die of the prior art machine was made of steel and did not include heat tubes. The heat seal die of the invention embodiment was made of hardened 440 stainless steel and included heat tubes. The invention embodiment and the prior art machine were identical in construction and operation except for the structure of the heat seal dies. Both machines were operating to heat seal laminated film in the formation of portion control packaged condiments.



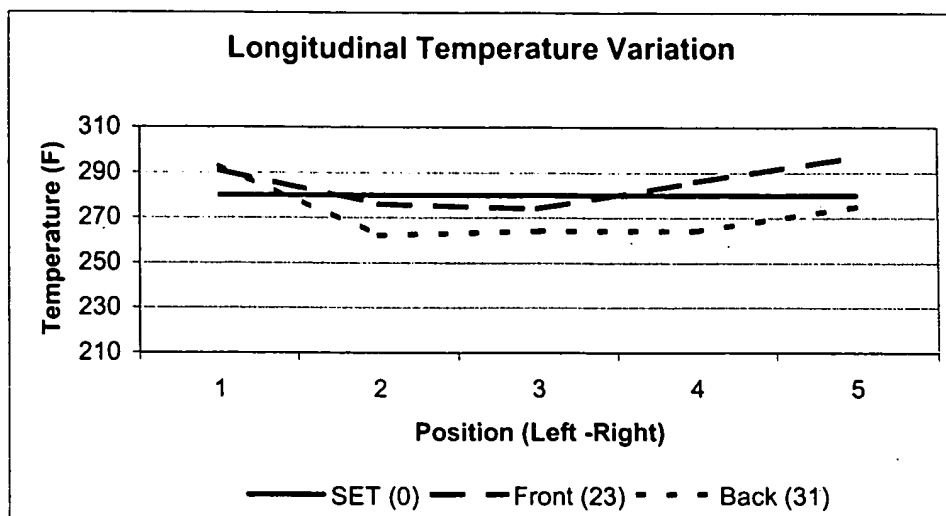


Figure 1: Operating Profile Without Invention

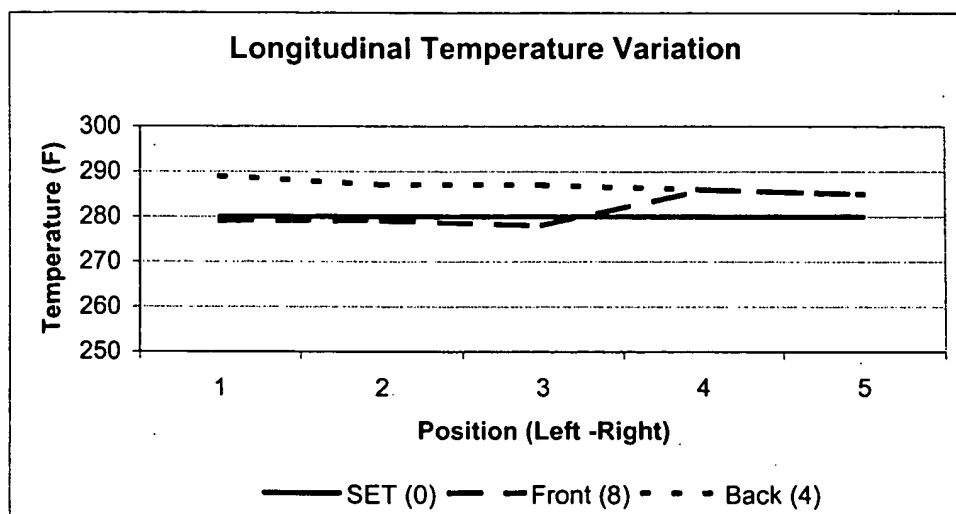


Figure 2: Operating Profile With Invention

20. These results are particularly unexpected in view of the disclosure in the Nakamura Patent, which teaches that heat tubes are inadequate for controlling temperature in heat seal dies.

21. Other commercial application of embodiments of this invention have also been unexpectedly successful. Golden States Foods (GSF) is a licensee under this patent application and uses form/fill/seal machines for manufacturing portion control packaged condiments such as ketchup. GSF is the largest supplier of liquid products to McDonald's restaurants.

22. In January 2002, the owner of this patent application, Printpack, in conjunction with GSF, installed embodiments of the invention encompassed by claims 9 and 18 of this application in a GSF liquid products plant in Conyers, Georgia. The embodiments implemented by Printpack and GSF were multi-lane, four side form/fill/seal machines for making portion control packaged condiments equipment with hardened stainless steel cross heat seal dies including longitudinal heat tubes (hereinafter the Embodiments). Prior to implementation of these Embodiments, GSF operated this form/fill/seal machines with cross heat seal dies made of steel and lacking heat tubes. (the Prior Art Machines).

23. The Prior Art Machines operated by GSF exhibited temperature variations exceeding 60°F across the cross heat seal dies, while specifications for the packaging film used normally set a 20°F variation. Such a discrepancy between film specifications for heat seal die temperature variation and actual cross heat seal die temperature variation in the Prior Art Machines reduced the seal integrity of the portion control packaging and increased the number of serum leakers.

24. The Embodiments installed and implemented at GSF in January 2002 reduced the temperature variation across the cross heat seal dies to less than 10°F and thereby significantly enhanced the cross seal integrity of the portion control packaging produced. As a result, the

number of cases of portion control packaged condiments withheld from distribution by GSF due to serum leakers dropped by 79% and labor necessary to rework such withheld cases dropped by about \$75,000 annually. The reduction in serum leakers also enhanced the quality of product delivered to GSF's customers.

25. Reducing serum leakers in portion controlled packaging has been a long felt, but unsatisfied need in the packaging industry. A publication titled "Portion Control and Flexible Packaging: A Reference Manual for the Dressings & Sauces Industry First Edition;" (The Association of Dressings & Sauces; August 1999; Atlanta, Ga; 150 pages) (hereinafter the "Manual") provides guidelines for portion control packaging of liquid containing materials such as condiments and sauces. This Association of Dressings & Sauces serves the market at which the invention described in the present application is directed. The Manual generally indicates that serum leakers are considered a serious problem in the portion control packaging industry. See *Manual*, pages 132-137. The Manual advises as follows:

"Packaging films have changed dramatically over the last 20 years, yet serum leakers were there then and they are still here now. Studies have been done varying sealant materials and sealant thickness along with packaging machine conditions."

See *Manual*, page 134.

26. The Manual speculates that "gathering of the film and subsequent wrinkles may be the cause of most serum leakers." See *Manual* page 132. The *Boeckmann* patent cited in the Office Action also focuses on wrinkles as the source of the problem. The Manual suggests that

portion control packaging machines must be maintained very diligently to minimize serum leakers. See *Manual*, page 134.

27. In "Table 8-4-Leaker analysis for Problem Solving", the Manual describes seven (7) types of defects from leaking, three (3) of which involve seal area faults.

Observed Defect	Possible Cause	Pattern	Action
Unsealed Seam Areas [5 of 7] 1)	Inadequate amount of sealant	No bonding in seal area. Gaps or spaces in seam	Confirm thickness of sealant layer against specification
2)	Defective composition of sealant layer	Reduced bond strength in seal area. Seam degenerates over storage	Packaging material defect
3)	Sealing temperature too low on sealing bars	No bonding in seal area. Leakers occur in same lane of equipment	Test and verify temperatures of heat seal bars. Replace units as needed
4)	Inadequate pressure on sealing bars, or poor mating of sealing bars	Reduced bond strength in seal area. Leakers will occur in repeat locations	Verify pressure with pressure sensitive paper. Replace springs as needed
5)	Inadequate dwell time on sealing bars	Reduced bond strength in seal area. Leakers occur in repeat locations	Reduce operating speeds. Timing adjustment
Cracks in seal area. [6 of 7]	Excessive pressure on sealing bars	1) Small breaks across seal area, or localized 2) Melted appearance or fracturing at seams	1) Adjust equipment. 2) Reduce and verify sealing bar temperatures
Serum Leakers after	Excessive heat or	Serum leakage from	Reduce storage

30 days [7 of 7]	pressure on the package in storage may contribute to serum leaker occurrence from any cause	package during storage. Very small seam interruption	effect if possible. Increase grade of corrugated material if needed.
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Manual, Pp. 80-82

28. The *Manual* is a current summary of industry beliefs and practices presents conflicting views on the causes of and remedies for leakers in multi-lane portion control packages. High temperatures and pressures are implicated in some cases (Table 8-4, 5.3, 5.5, and 6.2), while Appendix A No. 4 blames low temperatures and pressures. The one potentially consistent remedy, "reduce operating speed" (Table 8-4, 6.2) is not an economical option. While mention is made about "adjusting" and maintaining the performance of the packaging machinery components, no consideration is given to the ability of the machinery to maintain the tolerances necessary to prevent leakers and there is no recognition that uniformity of temperature across the heat seal die causes leakers.

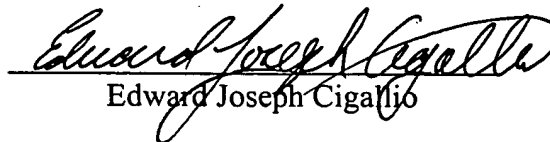
29. Furthermore, according to cited U.S. Patent 3,677,329 issued to *Kirkpatrick*, heat tubes have been available for over thirty years, but to my knowledge, they have not been implemented in portion control sized packaging heat seal dies until Applicants' invention. This could be due to the prior understanding in the art that heat tubes will be unsuitable, as taught by the *Nakamura* Patent.

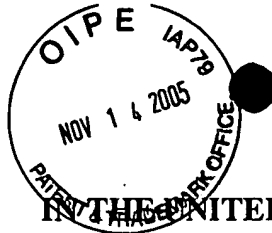
30. I declare that all statements made herein of my own knowledge and belief are true and that all statements made on information and belief are believed to be true, and further that

U.S.S.N. 09/954,443  
Filed: September 17, 2003  
DECLARATION UNDER 37 C.F.R. § 1.132

the statements are made with the knowledge that willful false statements are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Date: 9/29, 2003

  
Edward Joseph Cigallio



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

**James Robert Adair, Jr. et al.**

Serial No. **09/954,443**

Filing Date: **September 17, 2001**

For: **Heat Seal Die and System and Method  
For Portion Control Sized Packaging**

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**SECOND DECLARATION OF EDWARD JOSEPH CIGALLIO UNDER 37 C.F.R. §  
1.132**

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Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

I, Edward Joseph Cigallio, hereby declare that:

1. I am a co-inventor of the above-identified patent application (the "Patent Application") and have previously submitted a Declaration Under 37 C.F.R. § 1.132 for this application. This is a second Declaration to address issues raised in the Office Action mailed August 24, 2004 which I have reviewed along with cited references U.S. Patent 3,228,170 issued to Eisenstadt (the Eisenstadt Patent) and U.S. Patent 6,301,859 issued to Nakamura et al. (the Nakamura Patent).

2. It is my understanding that Claims 9, 12-18 and 21-26 are rejected under 35 USC §103(a) as being unpatentable over the Eisenstadt Patent in view of the Nakamura Patent. The Examiner cites the Eisenstadt Patent as disclosing all features of independent claims 9 and 18 of the application except the use of heat tubes in the die members.

4. Independent claim 9 of this application describes a system for making portion control sized packaged flowable liquid-containing condiments in a portion size in the range from 1 to 5 ounces comprising a form/fill/seal apparatus and a heat seal die that includes longitudinal heat seal tubes for substantially uniform heating of the die face of the heat seal die. Independent claim 18 describes a corresponding method for making portion control sized packaged flowable liquid-containing condiments in a portion size in the range from 1 to 5 ounces.

5. More particularly, the system of amended claim 9 of the present application describes a heat sealable material feeder, a flowable material feeder for feeding a flowable liquid-containing condiment, and a form/fill/seal apparatus structured and arranged for making portion control sized packages so that the portion control sized package has a portion size in the range from 1 to 5 ounces. Specifically, this form/fill/seal apparatus is structured and arranged for receiving the heat sealable material, forming a portion control sized package with the heat sealable material, filling the portion control sized package with the flowable liquid-containing condiment in a portion size in the range from 1 to 5 ounces, and sealing the portion control sized package. The form/fill/seal apparatus includes a heat seal die comprising first and second heating elements and first and second longitudinal heat tubes disposed, respectively, in first and second die members. The heat tubes, which can also be described as heat pipes, are disposed between the heating element and the die face of each die member for maintaining a substantially uniform heat seal temperature along the length of the die faces. The substantial uniformity of



heat seal die temperature significantly decreases the occurrence of serum leakers, which are packages that leak liquid through the package seal.

6. The Eisenstadt patent discloses an automatic machine 20 for packaging liquids and semi liquids such as mustard and syrup in individual portion size heat seal packages 24. This machine 20 generally includes a heat sealable plastic film feeder, a fluid or semi fluid feeder 100 for feeding the fluid or semi fluid substance 27, and a form/fill/seal mechanism 40 for forming the packages. The form/fill/seal mechanism 40 includes heat sealing jaws (46 and 64) for sealing the edges of the pouches.

7. The machine described in the Eisenstadt patent is a single lane form/fill/seal packaging machine meaning that it only forms one package at a time. The film fed through this machine is only wide enough to form one package at a time. The Eisenstadt patent does not disclose any detail regarding the structure of the heat sealing jaws or the manner of heating them. With a single lane, single serving packaging machine, the heat seal dies are small so that the temperature across the dies is easily kept uniform and serum leakers are not a problem. Serum leakers become a problem in multi-lane individual portion packaging machines because the heat seal dies are much longer and maintaining uniform temperature along the die is more difficult. This problem is not appreciated in the Eisenstadt patent.

8. The Eisenstadt Patent and the Nakamura Patent do not establish a *prima facie* case of obviousness against amended claims 9 and 18 of this application. First, there is no motivation to modify the Eisenstadt Patent to include heat tubes, because the Nakamura Patent actually teaches away from using heat tubes, does not suggest using heat tubes in portion control

sized packaging systems, and certainly does not appreciate the problems particular to the smaller, thinner portion control sized packaging heat seal dies. With portion control sized packaging heat seal dies, there is little concern about heat transfer through the depth of the dies, as they are small and thin. Instead, the concern is uniformity of temperature along the long length of the dies. This problem is well addressed by Applicants' invention as defined in independent claims 9 and 18 of this application, while the Nakamura Patent does not address portion control sized packaging systems or this problem, and even teaches away from using heat tubes.


9. In the Examiner's Response to Arguments set forth in the Office Action, the Examiner explains that the embodiments in Figs. 11A-B of the Nakamura patent illustrating heat tubes remain pertinent prior art despite any teaching away from using such embodiments in the Nakamura patent. Applicants do not dispute that the Nakamura patent is pertinent prior art. Applicants submit that the Nakamura patent is prior art that teaches away from using heat tubes in portion control packaging manufacturing and is a disincentive to one of ordinary skill in the art to combine the embodiments in the Nakamura patent illustrating heat tubes with the system disclosed in the Eisenstadt reference. The rejection in this Office Action is one of obviousness under 35 U.S.C. § 103. Particularly, the Examiner takes the position that it would have been obvious to combine the teachings of heat tubes in the Nakamura patent with the Eisenstadt patent. Applicants are not arguing that the Nakamura patent is non-analogous art. Applicants position is that the combination of the Nakamura patent and the Eisenstadt patent does not establish a prima facie case of obviousness because the Nakamura patent teaches away from combining heat tube technology with a form/fill/seal machine and therefore teaches away from

combining the Nakamura patent with the Eisenstadt patent. Because of this teaching away, there is no motivation to one of ordinary skill in the art to make such a combination.

10. Furthermore, the Eisenstadt patent is a single lane, individual serving form/fill/seal packaging machine and therefore the heat seal dies are small, so that the temperature across the dies is easily kept uniform and serum leakers are not a problem. Serum leakers become a problem in mult-lane individual portion form/fill/seal packaging machines because the heat seal dies are much longer and maintaining uniform temperatures along the dies is more difficult. This problem is not appreciated in the Eisenstadt patent. Thus, there is no motivation to address the problem and combine the Nakamura patent with the Eisenstadt patent.

11. I declare that all statements made herein of my own knowledge and belief are true and that all statements made on information and belief are believed to be true, and further that the statements are made with the knowledge that willful false statements are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Date: February 2, 2005

  
Edward Joseph Cigallio

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